

Application No. 10/777,177
Reply dated November 23, 2004
Response to Office Action dated August 25, 2004

REMARKS/ARGUMENTS

Description of amendments

Claims 4-7 and 14-31 are now pending and under examination. Applicant has rewritten claims 4-7 in independent form, added claims 14-31, and cancelled claims 1-3 and 8-13. No new matter has been added.

The new claims (*i.e.*, claims 14-31) are supported by the application as originally filed. For example, the new independent claims (*i.e.*, claims 14, 20, and 26) are supported by original claims 1 and 2, by Figure 2, and by the full paragraph on page 5.

Claims 15-19, 21-25, and 27-31 correspond to the original dependent claims.

Allowed and allowable claims

Applicant appreciates that the Examiner has indicated claims 4-7 would be allowable if they are rewritten to include all of the limitations of the base claim and any intervening claims. Claims 4-7 have been rewritten in independent form. Accordingly, claims 4-7 are in allowable form.

Rejections under 35 U.S.C. §§102 and 103(a)

Claims 1, 8 and 11 were rejected under 35 U.S.C. §102(b) as being anticipated by Brown (U.S. Patent 4,683,849). Claims 2, 3, 9, 10, 12, and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Brown in view of Nakamura (U.S. Patent 4,028,963) or JP 06-213278A. The cancellation of claims 1-3 and 8-13 renders the rejections moot.

Application No. 10/777,177
Reply dated November 23, 2004
Response to Office Action dated August 25, 2004

New claims

The new claims are patentable over the cited references. With regard to the new independent claims (*i.e.*, claims 14, 20, and 26), Brown does not disclose a main lubricant duct and a balancing shaft which is arranged within the main lubricant duct. In Figures 5 and 6, Brown illustrates an internal-combustion engine with four cylinders in a V-arrangement. A first balancing shaft (38) is arranged below a crankshaft (33), and a second balancing shaft (37) is arranged above the crankshaft (33). The two balancing shafts (37, 38) and the crankshaft (33) are situated in the same plane (Column 6, Lines 24 to 26). In other words, the rotation center points of the two balancing shafts (37, 38) and of the crankshaft (33) are situated on a perpendicular axis of symmetry. As illustrated in Figure 6, the balancing shafts (37, 38) are in each case supported by bearings on the walls of the crankcase. For example, the second balancing shaft (37) is supported by three bearings. In the area between the walls, the second balancing shaft (37) carries two balancing weights (39, 41).

Claims 14, 20, and 26 differ from Brown in that the main lubricant duct is provided in the cylinder V and the second balancing shaft is arranged within the main lubricant duct.

These differences have the result that the second balancing shaft additionally takes over the function of the main lubricant duct. This results in the advantage that additional space for the second balancing shaft is not required.

The objective task for generating this effect is considered to be that a space-optimized arrangement of the two balancing shafts in the case of an internal-combustion engine with four cylinders in the V arrangement is designed and that a reliable lubricant distribution is ensured.

Application No. 10/777,177
 Reply dated November 28, 2004
 Response to Office Action dated August 25, 2004

Nakamura also does not disclose an internal-combustion engine in a V-arrangement with a main lubricant duct in the cylinder V in which a second balancing shaft is arranged. From Nakamura, an internal-combustion engine with four cylinders in a bank-type arrangement is known. In this internal-combustion engine, a left-side balancing shaft (6) and a right-side balancing shaft (8) are arranged parallel to a crankshaft (5) (Figure 3). The two balancing shafts (6, 8) are supported by bearings on the walls of the crankcase (1). For example, the left-side balancing shaft (6) is supported by a bearing (21) and another bearing (18) on the crankcase (1). According to Figure 3, a corresponding hollow space in the crankcase (1) is provided between these two bearings (21, 18). In Figure 4A, an oil feeding duct (23) is provided in the left-side balancing shaft (6) for lubricating the two bearings (21, 18).

A person skilled in the art who starts out from Brown and wants to achieve the above-mentioned objective task will obtain the information from Nakamura to provide an oil feeding duct (reference number 23 of Nakamura) in the second balancing shaft (reference number 37 of Nakamura) for lubricating the bearings. By combining Brown with Nakamura, the person skilled in the art therefore arrives at a different solution than claims 14, 20, and 26.

Note: The main lubricant duct is a tunnel-type space in the crankcase. It is not possible to have a main lubricant duct in the crankcase of Brown because the crankcase of Brown is open in the area of the balancing weights (39, 44).

JP 06-213278A does not disclose an internal-combustion engine in a V-arrangement with two balancing shafts, the second balancing shaft being arranged in the main lubricant duct. A balancing shaft is known from JP 06-213278A. An oil bearing device (8) is illustrated inside the balancing shaft (1). Lubricant is fed in bearings (12, 13) by way of the opening (8) and an outlet (8b). A person skilled in the art, who starts out from Brown and wants to solve the above-mentioned objective task, obtains from JP 06-213278A only the

Application No. 10/777,177
Reply dated November 23, 2004
Response to Office Action dated August 25, 2004

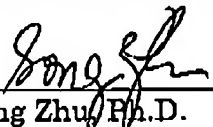
information of lubricating the bearings by way of a bore within the second balancing shaft. By combining Brown with JP 06-213278A, the person skilled in the art will arrive at the same solution as by combining Brown with Nakamura, so that the above note also applies here. Also the combination of Brown with JP 06-213278A provides the person skilled in the art with no information with respect to providing a main lubricant duct in the cylinder V and arranging the second balancing shaft in the main lubricant duct.

In light of the foregoing remarks, this application is considered to be in condition for allowance, and early passage of this case to issue is respectfully requested. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #08044353052US).

Respectfully submitted,

November 23, 2004



Song Zhu, Ph.D.
Registration No. 44,420
Donald D. Evenson
Registration No. 26,160

CROWELL & MORING LLP
Intellectual Property Group
P.O. Box 14300
Washington, DC 20044-4300
Telephone No.: (202) 624-2500
Facsimile No.: (202) 628-8844
DDE:SZ:tlm (848679)